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NICKEL IN JANUARY 2003

In January, reported domestic nickel consumption on a daily average basis was 3% greater than that of December 2002, according to the U.S. Geological Survey. Average daily nickel consumption of cathode, pellets, briquets, and ferronickel for stainless steel was 58.5 metric tons per day (t/d)—13% less than the 67.5 t/d for December 2002, and 4% less than the 60.8 t/d for January 2002. Consumption of elemental nickel to make superalloys decreased by 7% from December levels, but consumption to make corrosion-resistant nickel alloys rose by 11%. Sales to plating companies averaged 27.9 t/d, about the same as the December sales figure. Preliminary data indicate that U.S. apparent consumption of primary nickel in 2002 was 11% less than the 2001 figure of 129,000 metric tons (t). Reported consumption of primary nickel to make stainless steel—the largest end use—is projected to be up 3% from the 2001 figure of 33,700 t.

On January 31, 2003, U.S. consumer stocks of cathode, pellets, briquets, and powder totaled 1,490 t—12% less than the 1,700 t (revised) for yearend 2002 and 25% less than the 1,990 t reported for yearend 2001. Stocks in London Metal Exchange (LME) warehouses worldwide totaled 22,314 t—2% greater than the tonnage at yearend 2002. LME stocks were 148% greater than on March 31, 2001, when they bottomed out at 9,000 t after a 16-month slide. Preliminary data collected by the International Nickel Study Group indicated that, at yearend 2002, world nickel producers (excluding those in Austria, China, the former Yugoslavia, and the Ural area of Russia) had approximately 89,100 t of nickel in primary products in stock, of which 63,100 t or 71% were Class I materials. Class I materials are refined products with a nickel (Ni) content of 99% or greater (electrolytic cathode, pellets, briquets, rondelles, powder, etc.). Class II materials include ferronickel, oxide sinter, and East Asian utility nickel—products with a Ni content less than 99%.

Percentages reported in the above paragraphs may not be verifiable owing to concealment of individual company proprietary data and late reporting of data.

The United States imported 121,000 t of primary nickel in 2002, 11% less than the 136,000 t for 2001. Class I materials accounted for 86% of total primary imports received during 2002. Trade data for January 2003 will appear in a subsequent report.

Update

Russia—Norilsk Nickel announces long-range plans to increase nickel production capacity by 10%.—On March 18, 2003, the board of directors of JSC MMC Norilsk Nickel approved a modernization plan designed to increase the company's nickel production capacity by 10%. Under the plan, nickel production capacity would be increased to 240,000 metric tons per year (t/yr) of nickel from the current level of 218,000 t/yr. Production of platinum group metals (PGM) would remain at approximately the current undisclosed level. Copper production, however, would drop to about 420,000 t/yr from 454,000 t in 2002 (JSC MMC Norilsk Nickel, 2003a§[1], b§; Mining Journal, 2003).

Modernization is expected to cost between $3.6 billion and $5.3 billion. The project is scheduled to be completed by 2015 and would be paid for from internally generated funds. Norilsk Nickel currently derives about 45% of its sales revenue from PGM, 33% from nickel, and 14% from copper. In 2001, Norilsk Nickel recorded a net profit of $469 million on revenues of $4,378 million (Prokhorov, 2002).

Norilsk Nickel has two main mining divisions—the Polar Division located on the Taimyr Peninsula of north-central Siberia, and the Kola Mining and Metallurgical Company on the Kola Peninsula. Production operations would be upgraded in both divisions. The Polar Division would mine about 14 million metric tons per year (Mt/yr) of ore, up slightly from 13.6 Mt/yr. Approximately 7.6 Mt/yr, or 54% of the total, would be high-grade ore. The amount of cuprous ore mined would be doubled to 5.0 Mt/yr, or 36% of the total, while production of disseminated ores would drop to about 1.4 Mt/yr, or 10% of the total. The Taimyr ores would yield about 200,000 t/yr of nickel and 400,000 t/yr of copper. About 6.0 Mt/yr of ore would be mined on the Kola Peninsula, down slightly from the current 6.4 Mt/yr. The Kola division, which incorporates the echenganickel

[1] References that include a section mark (§) are found in the Internet References Cited Section.

and Severonickel Combines, would produce about 40,000 t/yr of nickel and 20,000 t/yr of copper.

Norilsk Nickel was planning to spend at least $125 million per year to improve its Taimyr mining operations. The money would be used primarily to expand operations at the Oktyabrsky and Taimyrsky mines and to develop the Skalistaya deposit. Production from the Skalistaya Mine would help offset declining production at other mines in the Talnakh area that have limited reserves. Two open-pit mines were developed at Norilsk during the 1940s. One of these mines, Medvezhiy Ruchey, is still operational today. Additional reserves were discovered at Talnakh, 25 kilometers (km) northeast of Norilsk, during the 1960s (Bond and Levine, 2001).

Renovation of outdated beneficiation operations has been a major goal of the company since its partial privatization in 1997. Upgrading the Talnakh concentrating mill, which opened in 1981, could cost as much as $160 million. The mill produces three types of concentrates—nickel-rich pentlandite, copper-rich chalcopyrite, and nickel-bearing pyrrhotite.
Development of the Severny-Gluboky deposit on the Kola Peninsula and related improvements would cost an additional $25 million per year. The Tsentralny Mine is currently the largest nickel mine on the Kola Peninsula. The mine consists of two open pits and has been in production since 1956. Ore reserves at the Tsentralny Mine, however, are being depleted rapidly (RAO Norilsk Nickel, 2000).

Some $400 million would be spent between 2003 and 2008 modernizing sulfide flotation equipment, smelters, refineries, and related facilities. The sinter plant at Norilsk, which dates from the 1940s, and the smelting shop of the adjoining nickel plant would be permanently closed by 2007. New smelting facilities would be constructed at the Norilsk copper plant and the Nadezhda metallurgical plant (15 km west of Norilsk). The Nadezhda plant, a large smelter built with the assistance of Outokumpu Oyj, produces converter matte, anode copper, and other intermediate products (Bond and Levine, 2001).

Company officials are hoping that the adoption of advanced high-grade matte leaching technology at Nadezhda will enable the complete closure of the Norilsk nickel plant and reduce the Polar Division's electricity costs at the refining stage by as much as 25%. Natural gas from the newly developed Peliatka gas field will help to reduce energy costs even further. A matte-leaching pilot plant for Nadezhda would cost about $12 million. Adoption of the leaching technology at Nadezhda would cost an estimated $600 million. Elemental sulfur production facilities would be installed at the upgraded copper and Nadezhda smelters, sharply reducing sulfur dioxide (SO_2) emissions. The new sulfur facilities would capture essentially all of the solid pollutants that now enter the atmosphere and would reduce SO_2 emissions on the Taimyr Peninsula by 70% from current levels. The construction of similar facilities at Pechenganickel could reduce SO_2 emissions on the Kola Peninsula by more than 90% by mid-2006. Grants and credits from the Government of Norway and the Nordic Investment Bank are in place to help pay for the Kola emissions reduction program (JSC MMC Norilsk Nickel, 2003b§).

In March 2003, Norilsk Nickel released 18,000 t of nickel from its 60,000 t stockpile. On April 8, the company announced that it was releasing an additional 18,000 t, lowering the stockpile to 24,000 t. The 60,000 t stockpile had been used as collateral to obtain a $200 million secured loan arranged by Credit Suisse First Boston International, ING Bank N.V., Standard Bank London Limited, and Natexis Banques Populaires in May 2002 (JSC MMC Norilsk Nickel, 2003c§).

In a second recent financial transaction, Norilsk Nickel agreed to invest $341 million in the Stillwater Mining Company in exchange for a 51% majority interest in Stillwater. Stillwater is the only U.S. producer of palladium and platinum and is the largest producer of primary PGM outside of South Africa and Russia.

Stillwater would transfer 45.5 million shares of newly issued common stock to Norimet, a wholly-owned subsidiary of Norilsk, in exchange for $100 million cash and 27.3 t (877,000 ounces) of palladium. Stillwater's stockholders have not yet approved the Norilsk Nickel transaction (JSC MMC Norilsk Nickel, 2002; Stillwater Mining Company, 2003b, p. 68-70). Stillwater has PGM mining operations on the J-M Reef in Montana near Nye and Big Timber. In 2002, Stillwater recovered 639 t (1,408,000 pounds) of byproduct nickel in solutions and crystals at its Columbus, MT, refinery (Stillwater Mining Co., 2003a, p. 9-10).

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TABLE 1
CONSUMPTION OF NICKEL (EXCLUSIVE OF SCRAP), BY FORM AND USE 1/

(Metric tons, nickel content)

Period	Cathodes, pellets, briquets, and powder	Ferronickel	Oxide-sinter, salts, and other forms	Total	Total year to date
2002:					
January	5,080	774	292	6,150	6,150
February	5,000	890	281	6,170	12,300
March	5,030	723	375	6,130	18,500
April	5,370	879	286	6,540	25,000
May	5,030	722	87	5,840	30,800
June	5,450	873	261	6,580	37,400
July	5,510	730	272	6,510	43,900
August	5,530	843	236	6,610	50,500
September	5,430	754	65	6,250	56,800
October	5,630	750	68	6,450	63,200
November	5,130	632	64	5,830	69,100
December	5,050 r/	505	60	5,610 r/	74,700
January-December	63,200	9,080	2,350	74,700	XX
2003:					
January:					
Steel:					
Stainless and heat resisting	1,280	529	W	1,810	1,810
Alloy (excludes stainless)	439	--	W	439	439
Superalloys	1,150	--	W	1,150	1,150
Copper-nickel alloys	W	--	--	W	W
Electric, magnetic, and expansion alloys	14	--	W	14	14
Other nickel & nickel alloys	W	--	W	W	W
Cast iron	W	--	--	W	W
Electroplating (sales to platers)	864	--	--	864	864
Chemical and chemical uses	W	--	--	W	W
Other uses	1,460	--	29	1,490	1,490
Total reported	5,210	529	29	5,770	5,770
Total all companies (calc) 3/	XX	XX	XX	8,880	8,880

r/ Revised. W Withheld to avoid disclosing company proprietary data; included in "Other uses" category. XX Not applicable.
-- Zero.

1/ Data are rounded to no more than three significant digits; may not add to totals shown.

2/ Of consumption, 4,310 metric tons were consumed as cathodes and pellets, the remainder as briquets and powder.

3/ Figures represent calculated apparent consumption; based on the revised proportion of reported primary consumption (65.01%) to apparent primary consumption for 2001.

TABLE 2
ENDING STOCKS OF NICKEL (EXCLUSIVE OF SCRAP) HELD BY CONSUMERS,
BY FORM AND USE 1/ 2/

(Metric tons, nickel content)

Period	Cathodes, pellets, briquets, and powder	Ferronickel	Oxide-sinter, salts, and other forms	Total
2002:				
January	1,800	832	282	2,920
February	2,110	454	106	2,670
March	2,340	494	135	2,970
April	2,490	513	94	3,100
May	2,250	82	127	2,460
June	1,840	63	138	2,040
July	1,580	98	97	1,770
August	1,910	112	83	2,100
September	2,370	89	78	2,530
October	1,990	140	76	2,210
November	1,820	93	84	2,000
December	1,700 r/	60	81 r/	1,840 r/
2003:				
January:				
Steel (stainless, heat resisting and alloy)	405	(3/)	(3/)	405
Nonferrous alloys 4/	1,070	(3/)	(3/)	1,070
Foundry (cast irons)	(3/)	--	--	(3/)
Chemical (catalysts, ceramics, plating salt, etc.) and unspecified uses	20	100	44	164
Total	1,490	100	44	1,640

r/ Revised. -- Zero.

1/ Data are rounded to no more than three significant digits; may not add to totals shown.

2/ Stocks held by companies that consume nickel in more than one end-use category are credited to the major category. Stocks are subject to revisions owing to inventory adjustments.

3/ Included in the "Chemical and unspecified uses" category.

4/ Includes superalloys, nickel-copper and copper-nickel alloys, permanent magnet alloys, and other nickel alloys.

TABLE 3
CONSUMPTION AND ENDING STOCKS OF PURCHASED SECONDARY NICKEL, BY USE 1/

(Metric tons, nickel content)

	Consumption			Stocks		
Period	Ferrous scrap 2/	Nonferrous scrap 3/	Total scrap	Ferrous scrap 2/	Nonferrous scrap 3/	Total scrap
2002:						
January	4,950	784	5,740	3,180	86	3,270
February	4,870	810	5,680	3,140	88	3,230
March	5,150	767	5,920	2,950	102	3,050
April	5,180	740	5,920	2,980	109	3,090
May	5,020	620	5,640	3,690	97	3,790
June	6,380	549	6,930	3,300	103	3,410
July	5,950	713	6,660	3,280	97	3,380
August	6,110	685	6,790	3,110	105	3,210
September	4,820	621	5,440	3,400	110	3,510
October	5,210	647	5,860	3,540	102	3,640
November	4,640	520	5,160	3,240	100	3,340
December	3,920	663	4,580	3,210	98	3,310
January-December	62,200	8,120	70,300	XX	XX	XX
2003:						
January	4,750	660	5,410	3,430	103	3,530

XX Not applicable.

1/ Data are rounded to no more than three significant digits; may not add to totals shown.

2/ Nickel content is calculated from an average nickel content and the reported gross weight of scrap.

3/ Combined consumption and stocks of aluminum-base, copper-base, and nickel-base scrap.

TABLE 4
U.S. IMPORTS FOR CONSUMPTION OF NICKEL, BY COUNTRY 1/

(Metric tons, nickel content) 2/

Period and country of origin	Cathodes pellets, and briquets	Powder and flakes	Ferro-nickel	Metal-lurgical-grade oxide	Waste and scrap	Stainless steel scrap	Chemicals	Total 3/	Total year to date 4/	Wrought nickel
2001:										
December	8,360	640	707	188	344	193	276	10,700	144,000	95
January-December	111,000	8,310	11,600	1,350	5,580	3,180	3,200	144,000	XX	1,140
2002:										
January	6,550	597	446	400	443	283	244	8,960	8,960	74
February	11,900	427	620	128	341	235	235	13,900	22,900	109
March	5,760	813	679	54	315	275	277	8,180	31,000	30
April	6,220	551	983	--	221	349	274	8,590	39,600	116
May	6,600	590	1,240	14	221	477	298	9,450	49,100	53
June	8,950	391	1,160	238	174	460	228	11,600	60,700	43
July	11,800	627	1,080	214	367	874	225	15,200	75,900	69
August	7,750	603	1,790	127	152	762	171	11,400	87,200	72
September	13,000	566	1,570	2	160	641	194	16,200	103,000	85
October	5,140	609	1,010	11	230	564	183	7,740	111,000	106
November	6,560	684	991	27	181	627	222	9,300	120,000	51
December:										
Australia	904	80	--	16	--	--	--	1,000	10,400	--
Brazil	20	--	--	--	17	--	--	37	842 r/	--
Canada	3,910	303	--	--	102	340	--	4,660	59,400	--
Colombia	--	--	95	--	--	--	--	95	2,550	--
Dominican Republic	--	--	654	--	--	--	--	654	6,720	--
Finland	60	104	--	--	--	--	50	214	4,640 r/	--
France	21	--	--	--	18	--	77	116	2,400	2
Germany	100	(5/)	--	--	6	--	16	122	1,160 r/	28
Japan	--	2	--	--	5	1	40	47	473	3
Mexico	--	--	--	--	--	162	--	162	1,470	--
New Caledonia	--	--	--	--	--	--	--	--	1,000	--
Norway	1,160	--	--	--	5	--	1	1,170	8,550	--
Russia	602	--	--	--	--	--	--	602	24,200	--
South Africa	20	--	--	--	--	--	--	20	339	--
Sweden	--	10	--	--	--	2	--	12	62	--
United Kingdom	54	4	(5/)	--	68	5	19	150	1,160	13
Venezuela	--	--	--	--	--	9	--	9	1,690	--
Zimbabwe	76	--	--	--	--	--	--	76	1,140	--
Other	38	9	1	--	4	11	109	173	1,560	24
Total	6,970	512	750	16	225	530	312	9,310	130,000	70
2002, January-December	97,200	6,970	12,300	1,230	3,030	6,080	2,860	130,000	XX	879

r/ Revised. XX Not applicable. -- Zero.

1/ Data are rounded to no more than three significant digits; may not add to totals shown.

2/ The nickel contents are assumed to be as follows: metallurgical-grade oxide (77%), waste and scrap (50%), and stainless steel sscrap (7.5%). The chemical category includes chlorides (25%), sulfates (22%), and other salts (22%), supported catalysts (22%), and oxide, sesquioxide, and hydroxide (65%).

3/ Excludes wrought nickel.

4/ May include revisions for prior months.

5/ Less than 1/2 unit.

Source: U.S. Census Bureau.

TABLE 5
U.S. EXPORTS OF NICKEL, BY COUNTRY 1/

(Metric tons, nickel content) 2/

Period and country of destination	Cathodes pellets, and briquets	Powder and flakes	Ferro-nickel	Metal-lurgical-grade oxide	Waste and scrap	Stainless steel scrap	Chemicals	Total 3/	Total year to date	Wrought nickel
2001:										
December	125	72	(4/)	131	1,290	2,310	198	4,130	57,000	163
January-December	1,400	1,380	50	1,940	15,700	32,900	3,680	57,000	XX	2,400
2002:										
January	344	135	6	122	1,110	1,030	233	2,990	2,990	192
February	170	81	3	152	989	3,720	229	5,350	8,330	167
March	245	151	(4/)	64	1,470	2,040	219	4,190	12,500	262
April	186	113	--	68	1,280	3,890	226	5,770	18,300	139
May	65	119	10	111	1,360	1,900	213	3,780	22,100	271
June	105	134	(4/)	19	1,550	2,500	155	4,470	26,500	283
July	131	139	1	9	1,560	2,040	204	4,080	30,600	200
August	76	222	1	42	826	1,510	168	2,840	33,400	230
September	164	122	2	55	718	1,660	153	2,880	36,300	249
October	113	99	8	34	1,010	1,840	167	3,280	39,600	221
November	64	95	8	6	830	1,470	184	2,650	42,300	181
December:										
Australia	--	(4/)	--	--	27	1	--	28	110	--
Belgium	(4/)	--	--	--	--	4	--	4	348	9
Canada	--	15	--	--	777	186	29	1,010	14,100	6
China	--	(4/)	7	--		422	--	429	5,280	--
Germany	--	10	--	--	9	4	7	30	1,040	10
India	--	(4/)	--	--	--	51	--	51	998	(4/)
Italy	--	(4/)	--	--	--	1	--	1	52	34
Japan	--	19	--	(4/)	70	57	14	160	1,890	--
Korea, Republic of	--	4	--	(4/)	--	128	78	210	6,570	1
Mexico	47	4	--	--	2	3	10	66	1,570	46
Netherlands	--	(4/)	--	--	9	4	--	13	711	2
South Africa	--	(4/)	--	3	38	--	1	42	89	--
Spain	--	(4/)	--	--	--	901	--	901	1,580	--
Sweden	--	--	--	--	--	--	--	--	646	(4/)
Taiwan	--	(4/)	--	--	--	244	(4/)	244	7,840	(4/)
United Kingdom	--	1	(4/)	--	50	49	(4/)	100	686	3
Other	28	12	--	--	1	23	284	348	2,410	64
Total	75	65	7	3	983	2,080	423	3,630	45,900	175
2002, January-December	1,740	1,480	46	685	13,700	25,700	2,580	45,900	XX	2,570

XX Not applicable. -- Zero.

1/ Data are rounded to no more than three significant digits; may not add to totals shown.

2/ The nickel contents are assumed to be as follows: metallurgical-grade oxide (77%), waste and scrap (50%), and stainless steel scrap (7.5%). The chemical category includes chlorides (25%), and other salts (22%), supported catalysts (22%), and oxide, sesquioxide, and hydroxide (65%).

3/ Excludes wrought nickel.

4/ Less than 1/2 unit.

Source: U.S. Census Bureau.

TABLE 6
U.S. IMPORTS FOR CONSUMPTION OF NICKEL ALLOYS, BY COUNTRY 1/

(Metric tons, gross weight)

Period and country of origin	Unwrought alloyed ingot	Bars, rods and profiles	Wire	Plates and sheets	Foil	Tubes and pipes	Other alloyed articles	Total	Total year to date
2001:									
December	350	354	342	300	1	140	126	1,610	20,400
January-December	4,110	3,860	5,030	3,070	15	2,600	1,770	20,400	XX
2002:									
January	353	231	399	329	--	203	155	1,670	1,670
February	183	177	408	227	1	248	154	1,400	3,070
March	256	207	407	293	(2/)	327	159	1,650	4,710
April	390	229	531	254	(2/)	233	151	1,790	6,500
May	179	248	456	289	1	337	162	1,670	8,170
June	232	293	401	286	15	511	122	1,860	10,000
July	133	259	624	361	31	124	196	1,730	11,800
August	170	217	360	356	34	180	161	1,480	13,200
September	64	153	412	207	35	243	131	1,250	14,500
October	180	150	400	212	28	106	117	1,190	15,700
November	231	279	324	348	28	194	149	1,550	17,200
December:									
Australia	51	--	--	--	--	--	--	51	1,020
Belgium	32	--	(2/)	--	--	--	9	41	209
Canada	--	--	--	--	(2/)	1	4	4	199
China	--	--	--	--	--	--	42	42	266
France	--	--	113	(2/)	--	7	1	120	1,180
Germany	3	43	162	192	21	63	7	491	6,660
Italy	--	83	--	--	--	10	(2/)	93	843
Japan	12	--	2	(2/)	(2/)	27	(2/)	42	1,580
Mexico	--	--	--	--	--	--	65	65	961
Netherlands	--	--	--	--	--	--	1	1	53
South Africa	39	--	--	--	--	--	--	39	333
Sweden	--	16	196	12	--	2	(2/)	226	2,550
United Kingdom	33	38	5	143	--	38	5	263	2,260
Other	--	12	32	6	(2/)	(2/)	19	68	674
Total	170	192	510	353	21	147	153	1,550	18,800
2002, January-December	2,540	2,640	5,230	3,520	196	2,850	1,810	18,800	XX

XX Not applicable. -- Zero.

1/ Data are rounded to no more than three significant digits; may not add to totals shown.

2/ Less than 1/2 unit.

Source: U.S. Census Bureau.

TABLE 7
U.S. EXPORTS OF NICKEL ALLOYS, BY COUNTRY 1/

(Metric tons, gross weight)

Period and country of destination	Unwrought alloyed ingot	Bars, rods and profiles	Wire	Plates and sheets	Foil	Tubes and pipes	Other alloyed articles	Total	Total year to date
2001:									
December	954	591	82	404	7	164	160	2,360	36,000
January-December	13,400	7,890	1,660	7,030	146	1,900	3,970	36,000	XX
2002:									
January	861	599	93	572	9	134	247	2,520	2,520
February	808	600	106	596	43	115	340	2,610	5,120
March	884	626	178	505	11	197	653	3,050	8,180
April	618	451	96	476	12	204	278	2,130	10,300
May	862	495	99	638	32	136	297	2,560	12,900
June	1,070	393	142	567	8	127	363	2,670	15,500
July	437	518	94	392	8	144	307	1,900	17,400
August	951	527	142	545	15	128	426	2,730	20,200
September	788	568	174	733	4	133	333	2,730	22,900
October	290	507	146	717	3	187	320	2,170	25,100
November	739	418	174	546	10	147	295	2,330	27,400
December:									
Australia	--	--	1	(2/)	--	--	(2/)	1	651
Belgium	11	16	3	(2/)	--	(2/)	1	31	1,370
Canada	2	35	21	44	3	19	133	257	2,920
France	209	85	(2/)	33	(2/)	--	1	328	3,690
Germany	5	46	1	24	(2/)	6	3	85	3,930
India	(2/)	1	(2/)	1	--	(2/)	5	7	101
Ireland	1	--	(2/)	1	--	(2/)	1	3	64
Italy	59	(2/)	2	2	--	3	3	69	1,370
Japan	62	4	3	5	1	(2/)	10	85	1,090
Korea, Republic of	7	12	(2/)	6	--	2	3	29	659
Mexico	--	1	31	26	(2/)	45	132	235	3,110
Netherlands	--	1	(2/)	--	(2/)	--	20	21	83
Singapore	(2/)	1	4	1	(2/)	3	8	17	193
Spain	--	(2/)	(2/)	--	--	(2/)	(2/)	1	84
Sweden	2	8	--	1	--	(2/)	(2/)	12	358
Switzerland	37	--	1	36	--	(2/)	--	74	665
Taiwan	(2/)	1	(2/)	10	--	4	11	26	410
United Kingdom	17	50	4	92	(2/)	5	2	170	4,660
Other	3	55	7	20	10	28	93	216	3,650
Total	415	316	78	302	14	115	426	1,660	29,100
2002, January-December	8,720	6,020	1,520	6,590	168	1,770	4,290	29,100	XX

XX Not applicable. -- Zero.

1/ Data are rounded to no more than three significant digits; may not add to totals shown.

2/ Less than 1/2 unit.

Source: U.S. Census Bureau.

TABLE 8
NICKEL CONSUMPTION IN CAST AND WROUGHT PRODUCTS

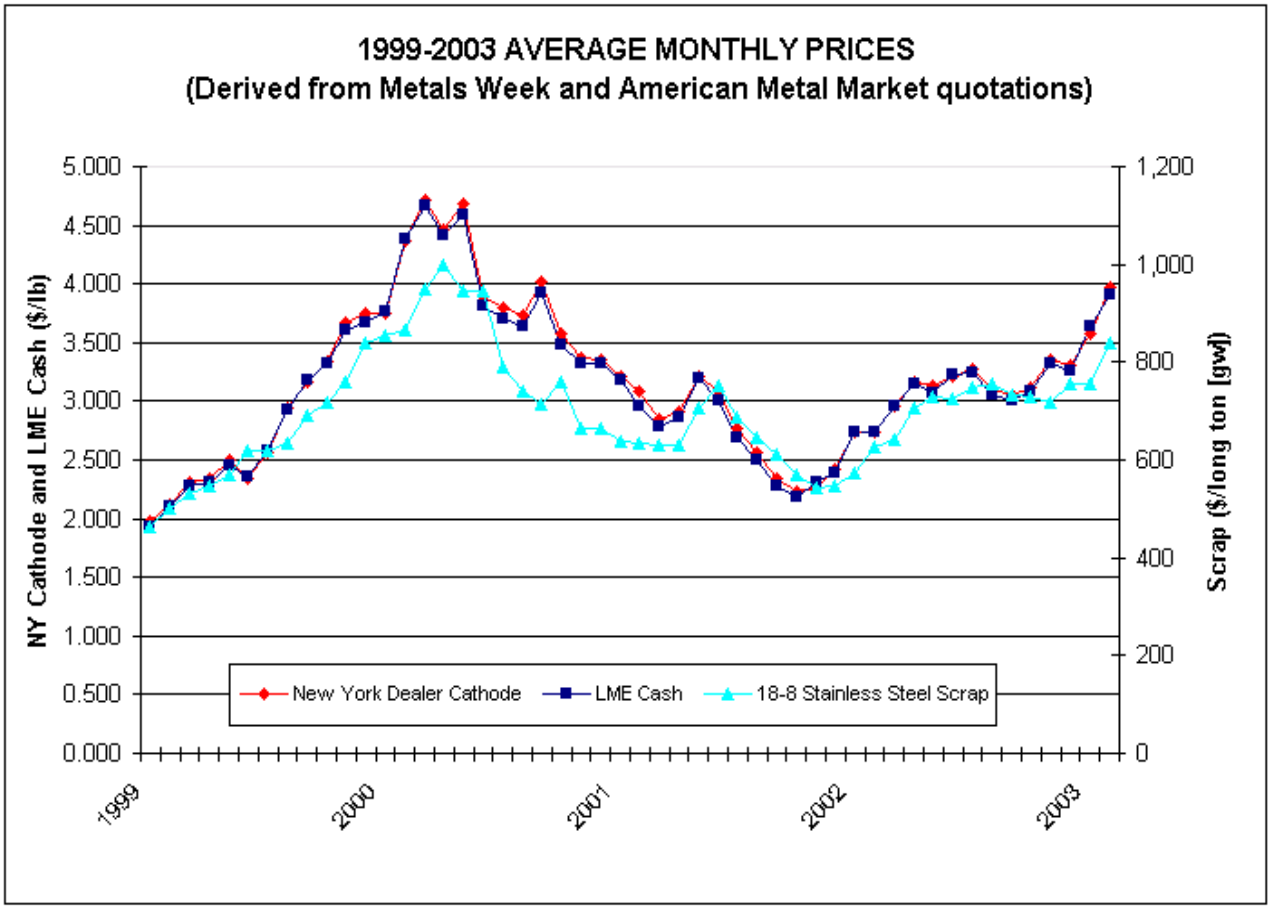
	Percent	
	Wrought	Cast
January 2003:		
Stainless and heat resisting steels	82	18
Alloy steels	99	1
Superalloys	82	18
Copper-nickel alloys	95	5
Other nickel-base alloys	100	(1/)

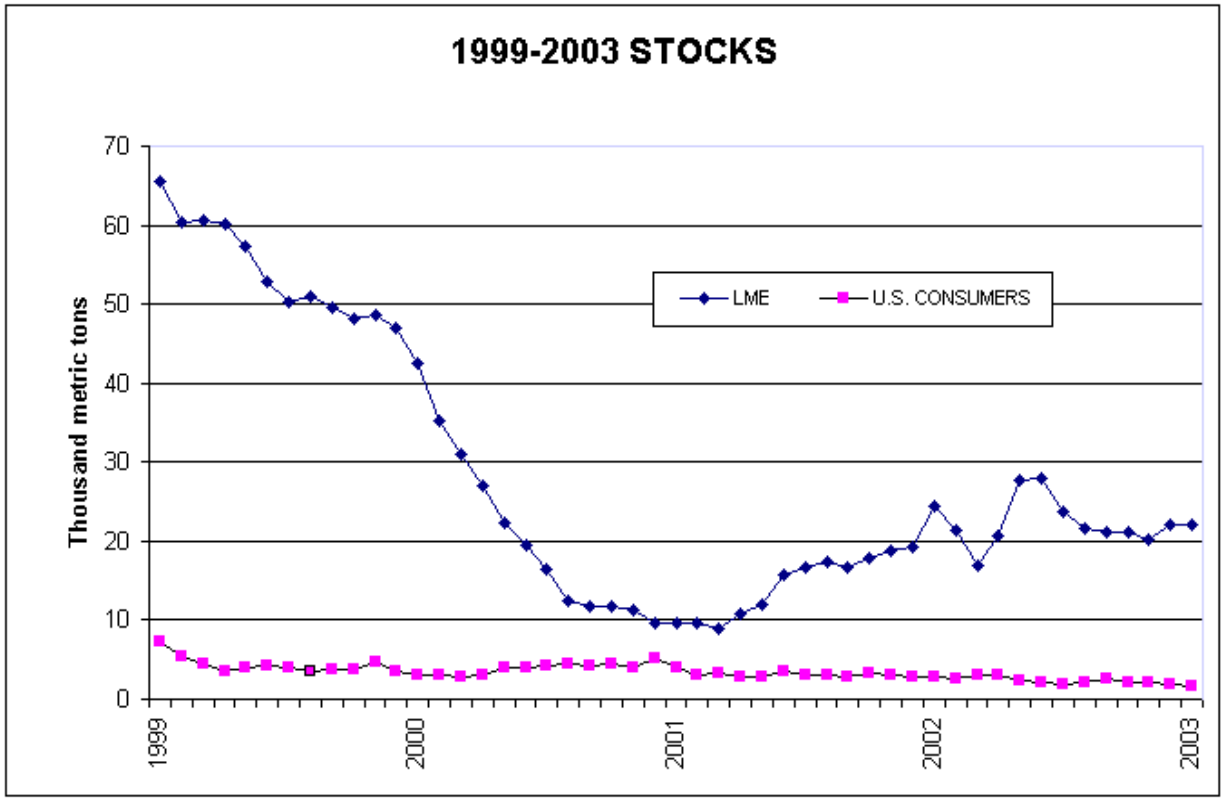
1/ Less than 1/2 unit.

TABLE 9
NICKEL PRICES

Date	Cathode NY Dealer $/lb.	LME Cash $/t	LME Cash $/lb.	18/8 Stainless steel scrap Pittsburgh $/long ton (gw)
2002:				
Average for week ending:				
December 6	3.47-3.51	7,375.500	3.345	700-725
December 13	3.30-3.36	7,161.500	3.248	745-765
December 20	3.16-3.33	7,052.000	3.199	745-765
December 27	3.30-3.37	7,217.500	3.274	745-765
Average for month of:				
January	2.736	6,043.182	2.741	573
February	2.745	6,029.250	2.735	625
March	2.963	6,537.500	2.965	643
April	3.163	6,958.214	3.156	705
May	3.130	6,761.364	3.067	731
June	3.213	7,119.861	3.230	725
July	3.268	7,142.717	3.240	748
August	3.094	6,717.143	3.047	755
September	3.053	6,640.238	3.012	733
October	3.118	6,804.457	3.086	729
November	3.349	7,313.929	3.318	716
December	3.308	7,193.158	3.263	755
Yearly average	3.095	6,771.751	3.072	703
2003:				
Average for week ending:				
January 3	3.31-3.38	7,240.625	3.284	745-765
January 10	3.43-3.67	7,694.000	3.490	750-765
January 17	3.67-3.72	7,977.500	3.619	750-765
January 24	3.70-3.94	8,420.000	3.819	750-765
January 31	3.79-4.05	8,288.500	3.760	750-765
February 7	3.83-3.94	8,362.000	3.793	835-845
February 14	3.95-4.06	8,512.500	3.861	835-845
February 21	3.95-4.11	8,634.000	3.916	835-845
February 28	4.18-4.27	8,983.500	4.075	835-845
Average for month of:				
January	3.580	8,026.020	3.641	757
February	3.978	8,623.000	3.911	840

Sources: Platts Metals Week and American Metal Market.


1999-2003 AVERAGE MONTHLY PRICES
(Derived from Metals Week and American Metal Market quotations)
NY Cathode and LME Cash ($/lb)
Scrap ($/long ton [gwl])
5.000
4.500
4.000
3.500
3.000
2.500
2.000
1.500
1.000
0.500
0.000
1,200
1,000
800
600
400
200
0
New York Dealer Cathode
LME Cash
18-8 Stainless Steel Scrap
1999
2000
2001
2002
2003


1999-2003 STOCKS
Thousand metric tons
70
60
50
40
30
20
10
0
LME
U.S. CONSUMERS
1999
2000
2001
2002
2003